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ABSTRACT

In this progress report of an interdisciplinary consortium effort, Project 2, Literature Search in Reading, funded by USOE's Targeted Research and Development Program in Reading, the author summarizes the project objectives, milestones, and strategies used to accomplish these milestones. The objectives as reported are (1) to identify and evaluate the significant literature in the reading process, learning to read, and language development; (2) to build models of these processes; (3) to describe and synthesize these models; and (4) to describe hypotheses and tests central to developing new research studies needed to refine and extend these models. The listed milestones are (1) a working bibliography of 8,200 references; (2) the development and use of a Reference Evaluation Form (REF) to evaluate the literature; (3) computerization of REF's by interrogation criteria; and (4) working papers identifying models and the state of knowledge. A description of the project personnel is also given. References and tables are included. (AW)

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QUEST FOR SYNTHESIS[1, 2]

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[1]CO-SPONSORED AERA-IRA SYMPOSIUM ON TARGETED RESEARCH AND DEVELOPMENT PROGRAM IN READING, PHASE I, RIGHT TO READ EFFORT, USOE NATIONAL CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT, FEBRUARY 4-7, 1971, AMERICAN EDUCATIONAL RESEARCH ASSOCIATION MEETING, AMERICANA HOTEL, NEW YORK CITY.

[2]THIS PAPER IS A PROGRESS REPORT OF AN INTERDISCIPLINARY CONSORTIUM EFFORT, PROJECT 2, LITERATURE SEARCH IN READING, FUNDED BY USOE'S TARGETED RESEARCH AND DEVELOPMENT PROGRAM IN READING (TRDPR).

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QUEST FOR SYNTHESIS[1]

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Introduction

This is the second overall public progress report of Project 2: Literature Search, Targeted Research and Development Program in Reading (TRDPR). The first presentation was given at the National Reading Conference in early December, St. Petersburg, Florida. Other reports presented at NRC were those by Athey (1) Geyer (4) and Singer (10). Reactions to those papers have been made by Goodman (7) and Samuels (9).

At this AERA meeting four other Symposia emerging from the Literature Search will be devoted to Language Models and Reading, Toward the Development of a Model of the Acquisition of Reading Skills and Developing an Informational-Flow Theory of Learning to Read and the Reading Process. In addition, I will be

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[1]Paper presented at co-sponsored AERA-IRA Symposium, Targeted Research and Development Program in Reading, Phase I, Right to Read Effort, USOE National Center for Educational Research and Development, Feb. 4-7, 1971, American Educational Research Association Meeting, Americana Hotel, New York City.

presenting a paper on "An Invisible College for Basic Research in Reading" at the Special Interest Group meeting in Reading on Sunday, February 7th between 12:15 and 1:15 p.m. at the Hilton Hotel. Other papers at that SIG meeting on Reading will be given by Monte Penney on "Planning for Targeted R & D in Reading" and Edmund Coleman, "Collecting a Data Base for a Reading Technology."

The remainder of this paper will summarize some of the milestones reached during the past eight months in a quest for synthesis, one of the four primary objectives outlined by Kling, Geyer, and Davis (6). The objectives, milestones, and strategies to accomplish these milestones will be discussed in the first part of the presentation and some perspectives on this whole research front area of modeling will be given in the second part of the paper.

Objectives

Objective 1.

> Identify and evaluate <u>all</u> significant contributions to the literature in:
>
> a. the reading process
> b. learning to read
> c. language development

Objective 2.

> Identify in the literature explanations of how these processes operate and how the behavioral events or operations within them interact with one another (in short, to identify or build models or partial models of these processes).

Objective 3.

> Describe and synthesize models and partial models so as to present as many different logically coherent models in each of these areas (or in any combination of the three) as seem necessary to exhaust the insights and evidence available.

Objective 4.

> Describe the hypotheses and associated tests central to developing new research studies needed to refine and extend the models presented, to test the assumptions upon which they were based, and to synthesize with them the unincorporated facts and insights of the fields studied.

The basic stance of these four objectives for Phase I, Pre-research as represented by Literature Search is what might be called sophisticated naivete; i.e., leave no stone unturned in an effort to zero in and refine the subsequent four phases called for in the Targeted Research and Development Program, namely, an Instructional System Component R & D, System Assembly and Test, Delivery System Development and Implementation, a ten year program for the 1970's as outlined by Gephart (2) (3) and Penney, Hjelm and Gephart (8).

As soon as the project was funded, Review Evaluators, Advisory panel members and the Central Processing Group at Rutgers were mobilized into the three area, Reading Process, Learning to Read and Language Development.

Within a given area a scholar was given the responsibility to cover a more specific section which is organized as a domain.

In the Reading Process Area the following are participating as Reviewer Evaluators: Wendell Weaver, University of Georgia, Psycholinguistics, H. Richard Schiffman, Rutgers, Sensory Processing, Frederick Davis, University of Pennsylvania, Psychometric Models, Norman and Jane Mackworth, Stanford University, Neuropsychology and Stanley Wanat, Stanford University, Experimental Linguistics.

Reading Process Area Advisors are: Paul Kolers, University of Toronto, Albert Kingston, University of Georgia, Robert Efron, V. A. Hospital, Martinez, California, and Karl Pribram, Stanford University.

In the Learning to Read Area the following are participating as Reviewer Evaluators: William Gillooly, Rutgers University, "Writing Systems," Joanna Williams, University of Pennsylvania, "Cognitive Affective" and Richard Bloom, State University of New York, Stony Brook, "Operant Models."

Learning to Read Advisors are: James Deese, Johns Hopkins University, J. Samuels, University of Minnesota and Harry Singer, University of California, Riverside.

In the Language Development area the following are participating as Reviewer Evaluators: Irene Athey, University of Rochester, "Language Models and Reading," Ronald Wardhaugh, University of Michigan, "Language Development and Reading," and Doris Entwistle, Johns Hopkins University, "Developmental Sociolinguistics."

Language Development Advisors are: Richard Hodges, University of Chicago and Robert Ruddell, University of California, Berkeley and David Elkind, University of Rochester.

Central Processing consists of Martin Kling, Principal Investigator, Frederick Davis, Director and John Geyer, Associate Director. Coordinators for the areas: Joanna Williams, "Learning to Read," Irene Athey, "Language Development" and John Geyer, "Reading Processes."

What is being reported as milestones reached thus far, are the results of the combined creative efforts of this team of 23 scholars from 13 universities and one research laboratory parceling out 12 domains in three areas of reading.

Milestones

Milestone 1.

Working bibliography of 8,200 references.

The working bibliography has been computerized with the aid of a retrieval program called TEXT-PAK initially developed by IBM and modified for use with the IBM 360/67. Printout of the working bibliography consists of printouts for each reviewer evaluator's and advisor's domain, the area and the entire project across areas. The listing is arranged alphabetically with each reference coded so that it can be identified as to who submitted the item. In addition, references submitted by more than one reviewer evaluator or advisor are indicated below each item. Items for working bibliography are accepted on a continuing basis. This is the second printout. A third updating toward the end of the project is anticipated for the final report.

Milestone 2.

Development and Use of a Reference Evaluation Form (REF) to Evaluate the Literature

Under the leadership of Dr. Jasan Millman, Professor of Educational Research Methodology, Cornell University, the TRDPR team developed

the REF. Three reference categories were formulated:

1. Model - formulates systematic explanation of phenomena that allows prediction

2. Research - tests hypotheses empirically or logically

3. Non-research - no attempt to test hypotheses empirically or logically

Some of the sections included in the REF are:

1. Title, author, source
2. Abstract
3. Constituent elements
4. Research design
5. Hypotheses (not tested)
6. Weak conclusions
7. Strong conclusions (Reviewer and author)
8. Strong conclusions (Reviewer)
9. Untested Hypotheses (name search)

The main purpose of the REF is to assess those references which warrant further critical review.

Thus far 550 REFs have been received and another 450 are expected by April 1st for a total of 1,000.

Milestone 3.

Computerization of REFs by Interrogation Criteria.

A Program has been developed to retrieve sections of the REF or an entire REF according to the nine sections listed under Milestone 2. At present 350 REFs are in computerized form and it is

expected that by April 1st most of the 1,000 REFs anticipated will be on tape. An example of a computerized printout is given in REF #020497.

Printout Exhibit here

Additional options for sorting by journal, date, and classification of model categories are afforded by TEXT-PAK in combination with the interrogation retrieval program for the REF.

In preparation for the TRDPR team's internal conference recently held at Rutgers between February 1-3, 197[illegible], the writer sorted 124 REFs which were classified as dealing with models.* These REFs represented the combined efforts of ten Reviewer Evaluators and presently all the REFs the project has on models.

In order to gain some knowledge in the nature of literature the references on models were sorted by journal.

Table I presents the most frequently occurring references appearing in 26 journals.

Insert Table I here

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*Gephart's (2) broad definition of model is accepted: "A Model is a representation of a phenomenom which displays the identifiable structural elements of that phenomenon, the relationship among those elements, and the processes involved in the natural phenomenon." (p. 38).

In the Reading Process Area we find two journals accounting for 50% of the references on models. Psychological Review accounts for 6 references and the Journal of Cognitive Psychology adds another 5 references.

In the Learning to Read Area two journals again account for half the journals. The two journals are Journal of Educational Psychology with 8 references and American Educational Research Journal with 6 references.

In the Language Development area three journals account for almost half (46%) of the references. The Journal of Verbal Learning and Verbal Behavior finds 5 references, Child Development 3 references and American Psychologist 3 references for a total of 11 references.

Only 4 out of the 26 journals are common to the three areas. Further, only one article by Gibson is mentioned by the three groups.

Finally, there is only one journal, Reading Research Quarterly which is concerned with reading only.

Although the 74 references are rather select and were prepared for special purposes it is still of interest to compare the 26 journals of the Literature Search Project in Table I with the 33 journals found by Summers (11) to account for 80% of the articles on reading between

1956-1966. Altogether these 33 journals accounted for 1192 references. Only three journals: American Educational Research Journal, Journal of Educational Psychology and Reading Research Quarterly overlap with those in the Literature Search project!

Indeed, the writer had a suspicion that perhaps many of the references weren't even in print in the years 1956-1966. To check the possibility that a new "research front" is developing, the journal and non-journal references were further sorted on publication years.

Table II clearly shows that the past few years have been most active in modeling. In fact, the past three years account for 90% of the references. Further, 25% of the references are in press or getting readied for publication. One journal, Cognitive Psychology was founded in 1970.

Insert Table II here

It appears that the late 60's and early 70's presage an era of interest and activity in modeling.

Another question of interest was getting a feel for the kinds of models that seemed to be emerging from the 124 references.

Table III summarizes some qualitative aspects of the models in our sample.

Insert Table III here

The biggest generalization that can be made about Table III is that regardless of area, the majority of the models were developed to generate research, are partial, are isomorphic and are research based. Data generation and the seeking of further understanding of these data in a more parsimonious and elegant manner seem to describe the state of the art of building models in reading.

The writer was also interested, for pedagogic and scientific reasons, as to what disciplines seem to have a bearing on these set of references dealing with models. Even though the N is so small and the sample rather select, there are still some rather clear-cut indications that Psychology, Information Processing, Linguistics and Education are the IN fields that seem to be contributing in about that order across the three areas. Table IV documents the details that lead to the generalizations indicated.

Time prevented further substantive analysis of the actual models found among the 124 references.

Milestone 4.

Working papers indentifying models and the state of knowledge.

Within the past three days (February 1-3, 1971) sixteen working papers were presented by 12 RE's, 4 Advisory Panel members and the Principal Investigator -- 100% on-time delivery.

Strategies for integrating these scheduled working papers with the convergence technique thinking outlined by Gephart (2) and the proposal by Kling, Geyer and Davis (6) were developed. Great use of the interrogating retrieval system for REF as well as RE, AP and CPG interfacing were delineated. Roles and time-lines were reassessed.

The Project is scheduled to end on June 30, 1971.

Whether or not the project continues on as an Information Network System with critical capabilities, we hope to report the outcomes of our Quest for Synthesis at the next AERA meeting in 1972.

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1. Athey, Irene J. "Theories of Language Development Underlying Reading," Twentieth Yearbook of the National Reading Conference. Milwaukee, Wisconsin: The National Reading Conference, 1970, In Press.

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8. Penney, Monte, Howard F. Hjelm, and William J. Gephart. "The Targeted Research and Development Program in Reading," American Educational Research Journal, Vol. VII, No. 3, May, 1970, 425-448.

9. Samuels, S. Jay. "Reactions to Geyer's 'Modeling Reading Processes' and Singer's 'Theories of Reading for Learning to Read in Primary Grades'." Preprint of article in the Twentieth Yearbook of the National Reading Conference. Milwaukee, Wisconsin: The National Reading Conference, 1970, In press.

10. Singer, Harry. "Theories of Reading for Learning to Read in the Primary Grades," Twentieth Yearbook of the National Reading Conference. Milwaukee, Wisconsin: The National Reading Conference, 1970, In press.

11. Summers, Edward G. "Reading Research Literature: Identification and Retrieval," Reading Research Quarterly, Fall 1968, Vol. IV, No. 1, 5-48.

TABLE I

MOST COMMONLY REFERRED TO JOURNALS
IN LITERATURE SEARCH OF READING PERTAINING TO MODELS

No.	Journal	Reading Process f	Learning To Read f	Language Development f
1.	Acta Psychologica	2	0	0
2.	Amer. Educ. Res. J.	0	6	0
3.	American Psychologist	0	0	3
4.	Brit. J. of Educ. Psych.	0	0	1
5.	Brit. J. of Psych.	1	0	0
6.	Child Development	0	1	3
7.	J. Cognitive Psych.	5	0	0
8.	Genetic Psych. Monogr.	0	0	1
9.	J. Child Psych. & Psychiatry	0	0	1
10.	J. Communic. Disorders	0	0	1
11.	J. Educ. Psych.	0	8	0
12.	J. Exp. Anal. of Behavior	0	1	0
13.	J. Exp. Child Psych.	0	0	1
14.	J. Exp. Psych.	0	2	0
15.	J. Speech & Hearing	0	0	2
16.	J. Typographic Res.	0	1	0
17.	J. Verbal Lrng. & Verbal Behavior	1	1	5
18.	Language	0	0	2
19.	Language & Speech	2	0	1
20.	Psych. Rev.	6	2	1
21.	Psychometrika	1	0	0
22.	Qtrly. J. Exp. Psych.	2	0	0
23.	Rdg. Res. Qtrly.	1	1	1
24.	Rev. Educ. Res.	0	3	0
25.	Science	1	2	1
26.	Sci. American	0	0	1
	Total References	22	28	24

TABLE II

PUBLICATION YEARS FOR REFERENCES IN JOURNALS,
BOOKS AND FUGITIVE MATERIALS
IN LITERATURE SEARCH OF READING PERTAINING TO MODELS

Area	No.Ref. f	Range	Mdn. Yr.	Modal Yr.
Reading Process	49	1964-1971	1969	1970
Learning to Read	28	1949-1970	1969	1970
Language Development	47	1954-1970	1966	1964

TABLE III

CLASSIFICATION OF MODEL CATEGORIES

A. By: Purpose

Area	Didactic N	Didactic %	Research Generation N	Research Generation %	Total N	Total %
Reading Process	4	8	44	92	48	100
Learning to Read	2	8	23	92	25	100
Language Development	9	19	38	81	47	100

B. By: Extent

Area	Partial N	Partial %	Comprehensive N	Comprehensive %	Total N	Total %
Reading Process	31	67	15	33	46	100
Learning to Read	22	85	4	15	26	100
Language Development	36	78	10	22	46	100

C. By: Type of Model

Area	Example N	Example %	Analogy N	Analogy %	Isomorph N	Isomorph %	Total N	Total %
Reading Process	14	38	7	19	16	43	37	100
Learning to Read	1	10	0	0	9	90	10	100
Language Development	16	35	4	10	25	55	45	100

D. By: Basis of Model

Area	Research N	Research %	Nonresearch N	Nonresearch %	Total N	Total %
Reading Process	41	98	1	2	42	100
Learning to Read	26	96	1	4	27	100
Language Development	37	81	9	19	46	100

TABLE IV

CLASSIFICATION OF MODEL
BY DISCIPLINE ORIENTATION

Discipline Orientation	Reading Process N	Rank	Learning to Read N	Rank	Language Development N	Rank
Education	9	4	20	2	4	4
Psychology	40	1	26	1	28	2
Information Processing	24	2	19	3	6	3
Sociology	0	7.5	0	7	0	6.25
Linguistics	14	3	16	4	40	1
Neurology	7	5	0	7	0	6.25
Math - Stat.	0	7.5	0	7	0	6.25
Other	3	6	1	5	0	6.25
Total	97		82		78	